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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/507,175	09/10/2004	Hiroji Aga	121026	8967
25944	7590	11/13/2007		
OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850			EXAMINER RODGERS, COLLEEN E	
			ART UNIT 2813	PAPER NUMBER
			MAIL DATE 11/13/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/507,175

Applicant(s)

AGA ET AL.

Examiner

Colleen E. Rodgers

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 8-11, 16-19, 24-27, 32-35 and 40 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 8-11, 16-19, 24-27, 32-35 and 40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

Applicant's submission filed on 2 July 2007 has been entered.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 8-11, 16-19, 24-27, 32-35 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Aga et al** (USPN 6,372,609).

Regarding claim 8, **Aga et al** disclose a method of producing an SOI wafer having a buried oxide film 3 with a thickness of less than 100 nm, comprising:

forming an oxide film 3 having a thickness of 100 nm or more [see col. 5, lines 58-61] on a surface of at least one of a bond wafer 2 and a base wafer 1, bonding the bond wafer 2 to the base wafer 2 through the formed oxide film 3 [see Fig. 1, step D], and making the bond wafer 2 into a thin film to form an SOI layer [see Fig. 1, step E], wherein the total thickness of the oxide film

formed on the surface of at least one of a bond wafer and a base wafer is thicker than the thickness of the buried oxide film formed thereby, and thereafter, an obtained bonded wafer is subjected to heat treatment [see Fig. 1, step F] to reduce the thickness of the buried oxide film.

**Aga et al** do not specifically disclose that the thickness of the buried oxide is reduced to less than 100 nm by the heat treatment. However, these claims are *prima facie* obvious without a showing that the claimed ranges achieve unexpected results relative to the prior art range. *In re Woodruff*, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also *In re Huang*, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996) (claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also *In re Boesch*, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill of art) and *In re Aller*, 105 USPQ 233 (CCPA 1955) (selection of optimum ranges within prior art in general conditions is obvious). In this case, there exists no evidence of record that the claimed heat treatment provides unexpected results in the thickness of the buried oxide layer produced. One of ordinary skill in the art would be motivated to optimize the thickness of the buried oxide layer to provide for device performance.

Regarding claim 9, **Aga et al** disclose the method of claim 8 as described above, furthermore wherein the SOI layer formed is 400 nm in thickness [see col. 9, lines 54-55].

Regarding claims 10 and 11, **Aga et al** disclose the methods of claim 8 and 9, respectively, furthermore wherein a heat treatment is performed in an inert gas atmosphere, at a temperature of 1000-1300°C [see col. 6, lines 24-34].

Regarding claims 16-19, **Aga et al** disclose the method of claims 8-11, respectively, as described above, furthermore wherein before the bond wafer is bonded to the base wafer, hydrogen

or rare gas ions are implanted into the surface layer portion of the bond wafer to form an ion-implanted layer, and after the ion-implanted surface of the bond wafer is bonded to the base wafer, the bond wafer is delaminated at the formed ion-implanted layer to make the bond wafer into a thin film [see col. 6, lines 1-13; see also Fig. 1, steps C and E].

Regarding claims 24-27 and 32-35, **Aga et al** disclose the method of claims 8-11 and 16-19, respectively, as described above, furthermore wherein after the heat treatment is performed, sacrificial oxidation is further performed [see col. 6, lines 47-49].

Regarding claim 40, **Aga et al** disclose an SOI wafer produced according to the method of claim 8.

#### ***Response to Amendment***

4. The Declaration under 37 CFR 1.132 filed 31 July 2007 is insufficient to overcome the rejection of claims 8-11, 16-19, 24-27, 32-35 and 40 based upon **Aga et al** (USPN 6,372,609) as set forth in the last Office action because: firstly, the results presented in Table 1 seem to indicate that the method taught by **Aga et al** is sufficient to achieve the claimed thinning of the oxide film from a thickness of 100 nm to a thickness of less than 100 nm (i.e., Example 1, wherein the heat treatment as taught by **Aga et al** is employed, namely heat treatment in argon gas at 1200°C for four hours, reduced the thickness of the oxide layer from 100 nm to 80 nm); secondly, the specifics of the heat treatment are not included in the independent claim, and in fact are only covered broadly in dependent claims 10 and 11 (i.e., a variety of atmospheres and an open ended temperature range are claimed, and no mention whatsoever is made of the time for which the heat treatment takes place); thirdly, Applicants' arguments regarding the generation of voids and blisters are not in line with the subject matter addressed by the claims, and furthermore it appears that the example that is in line

with the teachings of **Aga et al**, specifically Example 1, appears to achieve *better* results than do the results presented from the claimed method, specifically Examples 1', 2' 1" and 2". F

Finally, the Remarks dated 31 July 2007 poorly explain the Declaration, insofar as the Remarks allege, on page 3 of the Remarks, that Examples 1 and 2 are "in accordance to the recited method of the present claims," and that Examples 1 and 2 correspond with Examples 1 and 2 of Table 1 of the Declaration. However, Example 1 of Table 1 of the Declaration is in line with the teachings of **Aga et al** (an oxide layer 3 formed to a thickness of greater than or equal to 100 nm and subjected to heat treatment in argon gas at 1200°C for 4 hours), and Example 2 of Table 1 of the Declaration is in line with the teachings of the specification, but not, as noted above, with the instant claims (an oxide layer formed to a thickness of greater than or equal to 100 nm and subjected to heat treatment in argon gas at 1200°C for 14 hours). While the results of Example 2 indicate a greater thinning, the results of Example 1 nonetheless indicate that the conditions of **Aga et al** do, in fact, reduce the thickness to less than 100 nm as claimed. It is entirely unclear to the Examiner what Examples 1', 2', 1" and 2" are intended to display, since the conditions under which the oxide film is formed are in accordance with neither **Aga et al** nor the instant specification and claims.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colleen E. Rodgers whose telephone number is (571) 272-8603. The examiner can normally be reached on Monday through Friday, 9:00 AM to 6:00 PM.

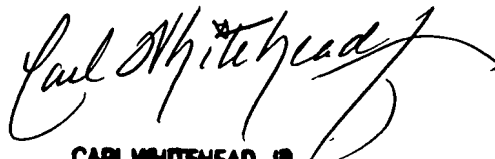
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CER

  
**CARL WHITEHEAD, JR.**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**